St. Augustine Orchid Society

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Media – Size Matters

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Orchid Growing Tips

Size really does matter… at least with respect to orchid growing. The size of the medium in which you place your orchids, the size of the pot, and even the size of a greenhouse all determine some aspect of your cultural practices.

Most novice growers do not consider that the medium magnifies the effective pot size for their orchid. Consider that an orchid mounted on a 1' x 1' flat board has one square foot from which to potentially absorb water, fertilizer, etc. A similar size piece of cork with its very irregular surface not only increases the effective surface area, but also creates small crevices and areas where water can sit or where temperature can vary so that orchid roots have more surface area from which to draw.

Potting media accomplish the same effect to a greater degree. Potting media, usually sold as coarse, medium, and fine, allows a grower to greatly expand the surface area from which an orchid can draw water and nutrients. Far more water and nutrients are held by a fine medium than by coarse medium in the same size pot. There is also correspondingly less air space. Most media that contain mixtures of ingredients, e.g. bark and charcoal, try to use similar size ingredients so that the ratio of material to air is high. While fine bark mixed with coarse bark increases the surface area it also lowers the air space by filling in gaps between coarse bark with fine bark. Avoid mixes that combine different sized products.

The more surface area, the more water and fertilizer that is potentially available to an orchid. Bacteria and fungi quickly cover the surface of an organic medium, enhancing its roughness and ability to hold water. They also enhance the nutrition of an orchid by converting the urea in many fertilizers to forms of nitrogen that orchids can use. In the process, though, they cause the medium surface to decay. The smaller the size of the medium the faster the process leads to a medium that will not support the growth of orchid roots. In fine media, there is little air space and the bacteria and fungi compete with plant roots for oxygen. When a medium is said to be "sour" that is the time when there is no oxygen present in the medium for extended periods of time; a condition that leads to the death of orchid roots.

Coarse media have small surface to volume ratios and provide less water and nutrients and more oxygen, but last longer, while small media are the opposite. The ultimate small medium is ground peat. Plants, including orchids, grow quickly in media dominated by ground peat, but can also lose their roots when the media "sours". There are a number of commercial media, including ProMix, which utilize peat as a major component. Often called "soiless", these media attempt to compensate by adding Perlite to soften and aerate the medium. While this lengthens the time plants can remain in the medium, it does not change the basic relationship of decay to particle size.

Pot size matters as well. As the pot size increases the same relationship of surface to volume changes with respect to the pot itself. Small pots have large surface area to volume ratios compared to big pots. This is especially important for clay or other porous surface pots as oxygen is exchanged through the clay and water lost to the atmosphere. Plastic pots do not exchange either water or oxygen through the pot, only through the surface medium and any holes in the pot bottom or side. The same type and size medium in clay pots tend to last

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longer than in plastic pots. Remember that decay is dependent on bacteria and fungi that grow more quickly on wet versus dry surfaces.

One other facet needs to be considered and that is roughness of the medium surface. Brick chunks are relatively smooth compared to the same size lava rock but hold relatively little water and fertilizer relative to lava rock. Nonorganic media do not harbor bacteria and fungi that decompose them and roughen the surface. They will eventually provide living space for bacteria that use excess fertilizer or decaying plant materials. This makes similar sized media of organic versus inorganic act very differently with respect to their role in both plant nutrition and water holding capacity.

The same basic concept applies to growing space as well. Large greenhouses take longer to change humidity and temperature and so are less vulnerable to rapid environmental change. Because they may also contain more plants, pots, media, etc that release water and store heat, large greenhouses also buffer rapid changes. Growing on a small windowsill versus a large greenhouse requires very different techniques and materials.

Finally, size does matter when it comes to flowers. Small orchid plants have limited ability to absorb and store light energy. Large, mature orchids are able to store all the energy required to produce the maximum number and size flowers possible for that individual clone. Until an orchid is mature, it can be difficult to know what the potential for the plant may be.